

FCC TEST REPORT

REPORT NO.: RF910207R01

MODEL NO.: Solo 1450

RECEIVED: Feb. 7, 2002

TESTED: Mar. 5 ~ Mar. 6, 2002

APPLICANT: QUANTA COMPUTER INC.

ADDRESS: 7F, No. 116, Hou Kang St., Shih Lin, Taipei,
Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: 47 14th Lin, Chiapau Tsun, Linko, Taipei,
Taiwan, R.O.C.

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0528
ILAC MRA



Lab Code: 200102-0

Table of Contents

1	CERTIFICATION	4
2	SUMMARY OF TEST RESULTS	5
3	GENERAL INFORMATION	6
3.1	GENERAL DESCRIPTION OF EUT	6
3.2	DESCRIPTION OF TEST MODES	7
3.3	GENERAL DESCRIPTION OF APPLIED STANDARDS	7
3.4	DESCRIPTION OF SUPPORT UNITS	8
4	TEST TYPES AND RESULTS	9
4.1	CONDUCTED EMISSION MEASUREMENT	9
4.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	9
4.1.2	TEST INSTRUMENTS	9
4.1.3	TEST PROCEDURES	10
4.1.4	TEST SETUP	10
4.1.5	EUT OPERATING CONDITIONS	11
4.1.6	TEST RESULTS	12
4.2	RADIATED EMISSION MEASUREMENT	18
4.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT	18
4.2.2	TEST INSTRUMENTS	19
4.2.3	TEST PROCEDURES	20
4.2.4	TEST SETUP	21
4.2.5	EUT OPERATING CONDITIONS	21
4.2.6	TEST RESULTS	22
4.3	6dB BANDWIDTH MEASUREMENT	27
4.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	27
4.3.2	TEST INSTRUMENTS	27
4.3.3	TEST PROCEDURE	28
4.3.4	TEST SETUP	28
4.3.5	EUT OPERATING CONDITIONS	28
4.3.6	TEST RESULTS	29
4.4	MAXIMUM PEAK OUTPUT POWER	33
4.4.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT	33
4.4.2	TEST INSTRUMENTS	33
4.4.3	TEST PROCEDURES	34
4.4.4	TEST SETUP	34
4.4.5	EUT OPERATING CONDITIONS	34



4.4.6	TEST RESULTS.....	35
4.5	POWER SPECTRAL DENSITY MEASUREMENT	36
4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	36
4.5.2	TEST INSTRUMENTS	36
4.5.3	TEST PROCEDURE	37
4.5.4	TEST SETUP	37
4.5.5	EUT OPERATING CONDITIONS.....	37
4.5.6	TEST RESULTS.....	38
4.6	BAND EDGES MEASUREMENT	42
4.6.1	LIMITS OF BAND EDGES MEASUREMENT	42
4.6.2	TEST INSTRUMENTS	42
4.6.3	TEST PROCEDURE	42
4.6.4	EUT OPERATING CONDITION	43
4.6.5	TEST RESULTS.....	43
4.7	ANTENNA REQUIREMENT.....	46
4.7.1	STANDARD APPLICABLE.....	46
4.7.2	ANTENNA CONNECTED CONSTRUCTION.....	46
5	PHOTOGRAPHS OF THE TEST CONFIGURATION	47
6	INFORMATION ON THE TESTING LABORATORIES.....	49



1 CERTIFICATION

PRODUCT : Notebook PC (with 2.4GHz Wireless USB interface card)
BRAND NAME : Gateway
MODEL NO. : Solo 1450
APPLICANT : QUANTA COMPUTER INC.
STANDARDS : 47 CFR Part 15, Subpart C (Section 15.247),
ANSI C63.4-1992, Canada RSS 210,
New Zealand RFS 29

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from Mar. 5, 2002 to Mar. 6, 2002, The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

TESTED BY: Bruce Shiau, DATE: Mar. 11, 2002
Bruce Shiau

CHECKED BY: Demi Chen, DATE: Mar. 11, 2002
Demi Chen

APPROVED BY: Alan Lane, DATE: Mar. 11, 2002
Dr. Alan Lane
Manager

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
Standard Section	Test Type and Limit	Result	REMARK
15.207	AC Power Conducted Emission Limit: 48dBuV	PASS	Meet the requirement of limit Minimum passing margin is -8.12dBuV at 5.488MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit
15.247(c)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -2.6dBuV at 4076.00MHz
15.247(d)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit
15.247(c)	Band Edge Measurement Limit: 20 dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Notebook PC (with 2.4GHz Wireless USB interface card)
MODEL NO.	Solo 1450
POWER SUPPLY	3.3VDC from notebook
MODULATION TYPE	CCK, BPSK, QPSK
RADIO TECHNOLOGY	DSSS
TRANSFER RATE	1/2/5.5/11Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	13.82dBm
ANTENNA TYPE	Dipole Antenna
DATA CABLE	NA
I/O PORTS	Please refer to User's Manual
ASSOCIATED DEVICES	NA

NOTE: For a more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided in this EUT.

Channel	Frequency	Channel	Frequency
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

NOTE:

1. Below 1GHz, the channel 1, 6, and 11 were pre-tested in chamber. The channel 11, worst case one, was chosen for final test.
2. Above 1GHz, the channel 1, 6, and 11 were tested individually.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Notebook PC (with 2.4GHz Wireless USB interface card). According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC CFR 47 Part 15, Subpart C. (15.247)

ANSI C63.4 : 1992, Canada RSS 210, New Zealand RFS 29

All tests have been performed and recorded as per the above standards.

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	Gateway	Solo 1450	NA	HFS145015318
2	PRINTER	HP	2225C+	3123S97230	DSI6XU2225
3	MODEM	ACEEX	1414	980020510	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.
3	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.

NOTE: All power cords of the above support units are non shielded (1.8m).

4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class B (dBuV)	
	Quasi-peak	Average
0.45 – 30	48	-

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. All emanations from a class B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS30	845552/004	May. 22, 2002
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH2-Z5	828075/003	July 19, 2002
ROHDE & SCHWARZ 200-A Four-line V-Network	ENV4200	830326/018	Oct. 25, 2002
* ROHDE & SCHWARZ 4-wire ISN	ENY41	838119/028	Dec. 2, 2002
* ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/018	Dec. 2, 2002
EMCO-L.I.S.N. (for peripheral)	3825/2	90031627	July 19, 2002
Software	Cond-V2L	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C05.01	July 19, 2002
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-305	Feb. 20, 2003
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-306	Feb. 20, 2003
Shielded Room	Site 5	ADT-C05	NA
VCCI Site Registration No.	Site 5	C-1093	NA

NOTE: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.

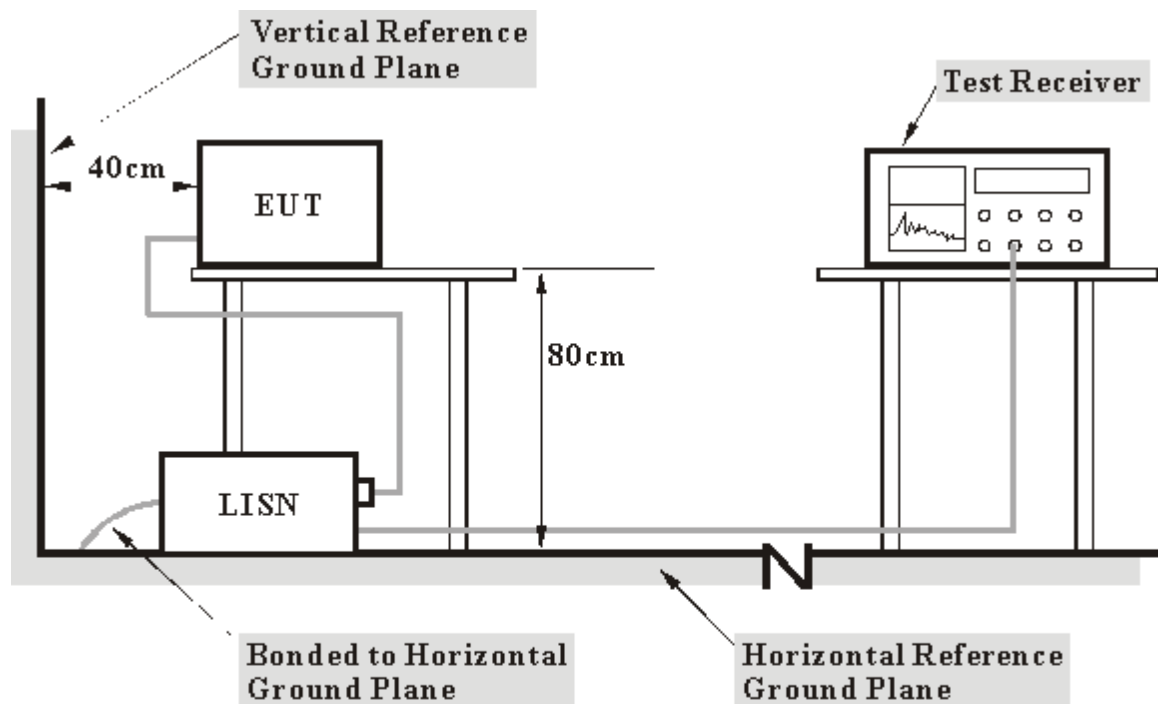
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

3. “*”: These equipment are used for conducted telecom port test only (if tested).

4.1.3 TEST PROCEDURES

- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 450 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

4.1.4 TEST SETUP



- Note:**
- Support units were connected to second LISN.
 - Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.



4.1.5 EUT OPERATING CONDITIONS

- a. Connected the EUT to a computer system placed on a testing table.
- b. The computer system ran a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- c. The computer system sent "H" messages to its screen.
- d. The computer system sent "H" messages to modem.
- e. The computer system sent "H" messages to printer, and the printer prints them on paper.

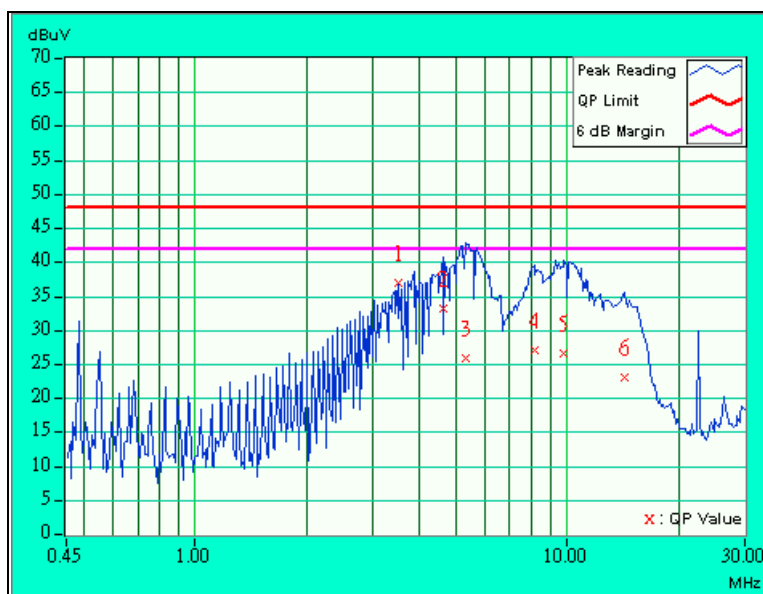
4.1.6 TEST RESULTS

EUT	Notebook PC (with 2.4GHz Wireless USB interface card)	MODEL	Solo 1450
MODE	Channel 1	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70%RH, 1005 hPa	TESTED BY: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	3.520	0.35	36.23	-	36.58	-	48.00	-	-11.42	-
2	4.621	0.42	32.48	-	32.90	-	48.00	-	-15.10	-
3	5.309	0.44	25.35	-	25.79	-	48.00	-	-22.21	-
4	8.141	0.54	26.34	-	26.88	-	48.00	-	-21.12	-
5	9.793	0.59	25.96	-	26.55	-	48.00	-	-21.45	-
6	14.203	0.68	22.37	-	23.05	-	48.00	-	-24.95	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

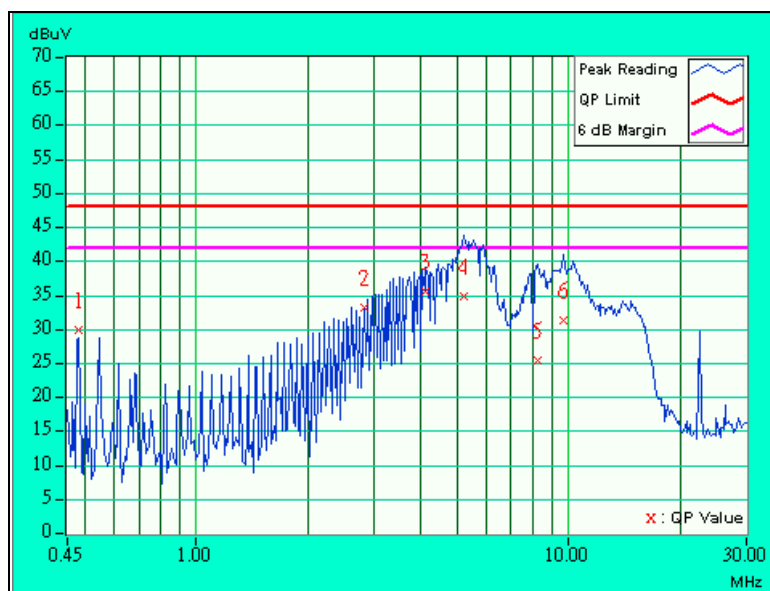


EUT	Notebook PC (with 2.4GHz Wireless USB interface card)	MODEL	Solo 1450
MODE	Channel 1	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70%RH, 1005 hPa	TESTED BY: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.481	0.11	29.46	-	29.57	-	48.00	-	-18.43	-
2	2.820	0.24	32.94	-	33.18	-	48.00	-	-14.82	-
3	4.125	0.30	35.18	-	35.48	-	48.00	-	-12.52	-
4	5.227	0.32	34.38	-	34.70	-	48.00	-	-13.30	-
5	8.250	0.37	25.07	-	25.44	-	48.00	-	-22.56	-
6	9.695	0.39	30.89	-	31.28	-	48.00	-	-16.72	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

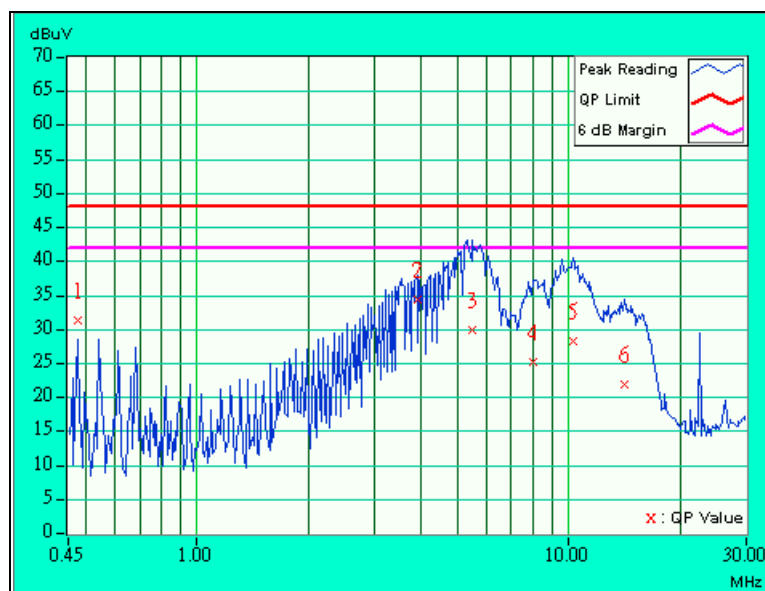


EUT	Notebook PC (with 2.4GHz Wireless USB interface card)	MODEL	Solo 1450
MODE	Channel 6	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70%RH, 1005 hPa	TESTED BY: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.477	0.11	30.63	-	30.74	-	48.00	-	-17.26	-
2	3.902	0.39	33.67	-	34.06	-	48.00	-	-13.94	-
3	5.477	0.45	29.20	-	29.65	-	48.00	-	-18.35	-
4	8.008	0.53	24.63	-	25.16	-	48.00	-	-22.84	-
5	10.266	0.61	27.69	-	28.30	-	48.00	-	-19.70	-
6	14.164	0.68	21.16	-	21.84	-	48.00	-	-26.16	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

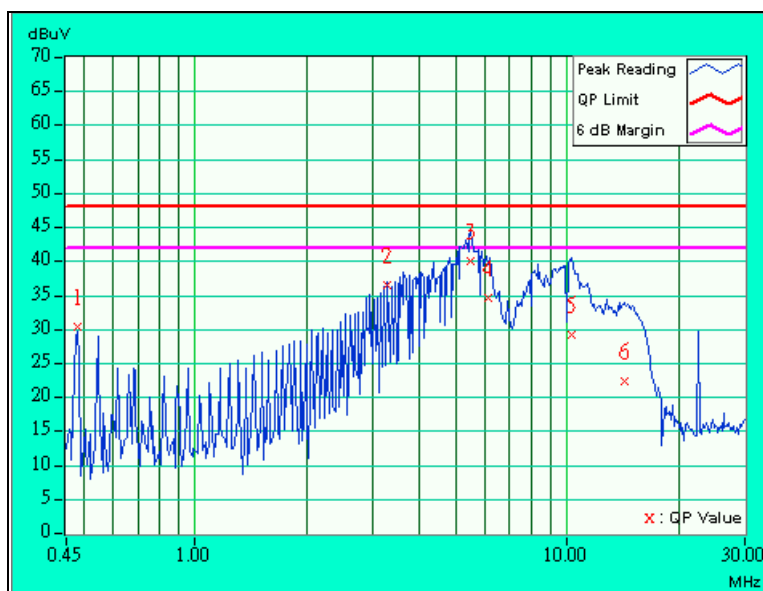


EUT	Notebook PC (with 2.4GHz Wireless USB interface card)	MODEL	Solo 1450
MODE	Channel 6	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70%RH, 1005 hPa	TESTED BY: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (Uv)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.481	0.11	29.81	-	29.92	-	48.00	-	-18.08	-
2	3.293	0.26	36.08	-	36.34	-	48.00	-	-11.66	-
3	5.488	0.32	39.56	-	39.88	-	48.00	-	-8.12	-
4	6.109	0.34	34.13	-	34.47	-	48.00	-	-13.53	-
5	10.223	0.40	28.72	-	29.12	-	48.00	-	-18.88	-
6	14.207	0.48	21.98	-	22.46	-	48.00	-	-25.54	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

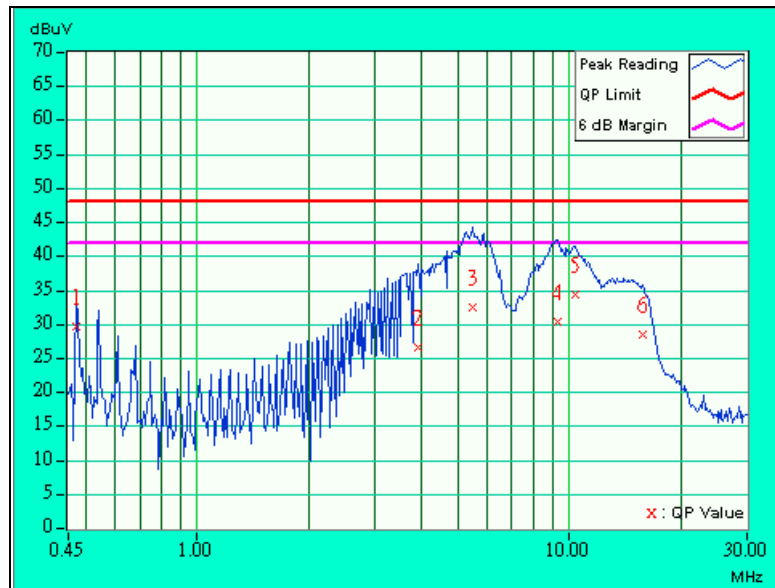


EUT	Notebook PC (with 2.4GHz Wireless USB interface card)	MODEL	Solo 1450
MODE	Channel 11	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70%RH, 1005 hPa	TESTED BY: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.473	0.11	29.01	-	29.12	-	48.00	-	-18.88	-
2	3.938	0.39	25.95	-	26.34	-	48.00	-	-21.66	-
3	5.492	0.45	31.74	-	32.19	-	48.00	-	-15.81	-
4	9.289	0.58	29.73	-	30.31	-	48.00	-	-17.69	-
5	10.383	0.61	33.66	-	34.27	-	48.00	-	-13.73	-
6	15.762	0.75	27.81	-	28.56	-	48.00	-	-19.44	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

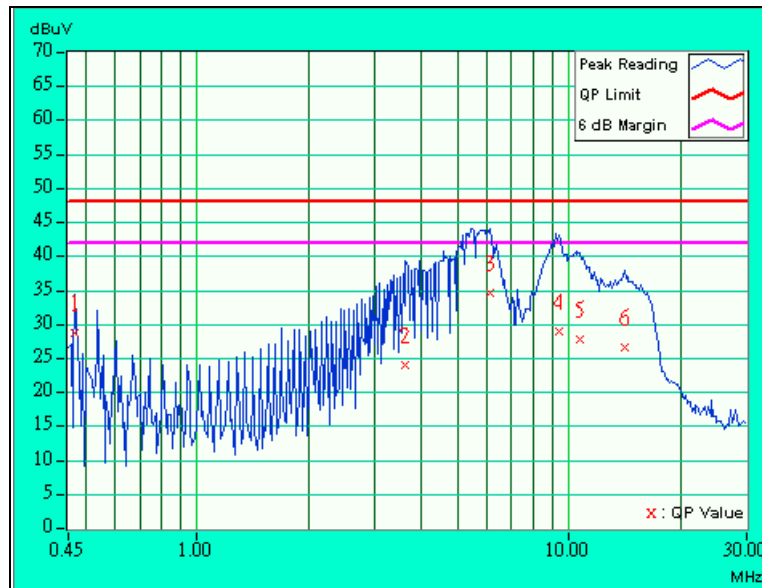


EUT	Notebook PC (with 2.4GHz Wireless USB interface card)	MODEL	Solo 1450
MODE	Channel 11	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Netural (N)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70%RH, 1005 hPa	TESTED BY: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.470	0.11	28.21	-	28.32	-	48.00	-	-19.68	-
2	3.637	0.28	23.60	-	23.88	-	48.00	-	-24.12	-
3	6.134	0.34	34.07	-	34.41	-	48.00	-	-13.59	-
4	9.375	0.39	28.55	-	28.94	-	48.00	-	-19.06	-
5	10.645	0.41	27.36	-	27.77	-	48.00	-	-20.23	-
6	14.086	0.48	26.19	-	26.67	-	48.00	-	-21.33	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field Strength of Fundamental	
	uV/m	dBuV/m
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Spectrum Analyzer	8590L	3544A01176	May 7, 2002
* HP Preamplifier	8447D	2944A08485	May 7, 2002
* HP Preamplifier	8449B	3008A01201	Dec. 06, 2002
* HP Preamplifier	8449B	3008A01292	Aug. 21, 2002
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Jan. 27, 2003
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2002
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 2, 2002
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	July 6, 2002
* EMCO Horn Antenna	3115	9312-4192	April 15, 2002
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	AS61D4	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Aug. 2, 2002
* TIMES RF cable	LMR-600	CABLE-ST5-01	Aug. 2, 2002
Open Field Test Site	Site 5	ADT-R05	July 28, 2002
VCCI Site Registration No.	Site 5	R-1039	NA
Site Registration No.	FCC: 90422 Canada IC: IC 3789 VCCI : R-1039		

NOTE: 1. The measurement uncertainty is less than +/- 3.0dB, which is calculated as per the NAMAS document NIS81.

2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

3. "*" = These equipment are used for the final measurement.

4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz.



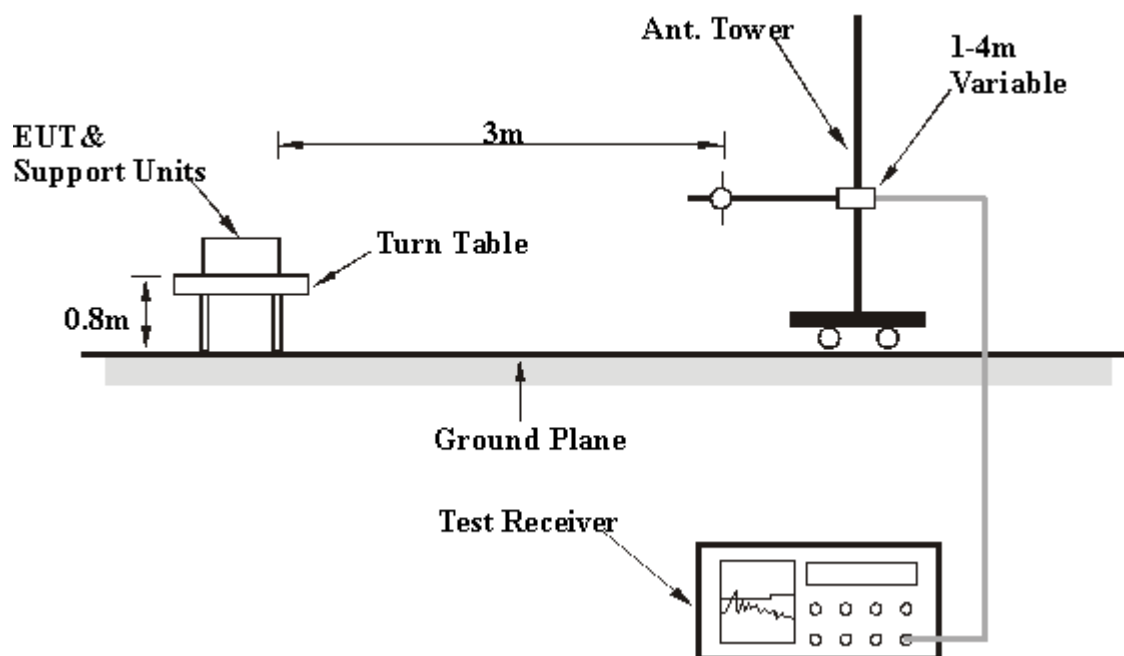
4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for Average detection (AV) at frequency above 1GHz.

4.2.4 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.2.5 EUT OPERATING CONDITIONS

Same as 4.1.5.

4.2.6 TEST RESULTS

EUT	Notebook PC (with 2.4GHz Wireless USB interface card)	MODEL	Solo 1450
MODE	Channel 11	FREQUENCY RANGE	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20 deg. C, 70 % RH, 1050 hPa	TESTED BY: Bruce Shiau	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	132.00	32.3 QP	43.50	-11.20	1.09H	216	20.00	11.16	1.13	0.00	-12.29
2	308.00	34.3 QP	46.00	-11.70	1.05H	174	19.00	13.38	1.91	0.00	-15.29
3	333.50	35.9 QP	46.00	-10.10	1.05H	141	20.00	13.87	1.99	0.00	-15.86
4	352.00	34.4 QP	46.00	-11.60	1.08H	104	18.00	14.31	2.05	0.00	-16.36
5	396.00	35.2 QP	46.00	-10.80	1.12H	49	17.00	15.96	2.22	0.00	-18.19
6	440.00	34.4 QP	46.00	-11.60	1.09H	38	15.70	16.32	2.38	0.00	-18.70
7	748.00	34.4 QP	46.00	-11.60	1.14H	83	11.00	20.14	3.26	0.00	-23.41
8	792.00	35.9 QP	46.00	-10.10	1.08H	120	12.00	20.60	3.31	0.00	-23.91

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

EUT	Notebook PC (with 2.4GHz Wireless USB interface card)	MODEL	Solo 1450
MODE	Channel 11	FREQUENCY RANGE	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20 deg. C, 70 % RH, 1050 hPa	TESTED BY:	Bruce Shiau

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	132.00	30.3 QP	43.50	-13.20	1.05V	308	18.00	11.16	1.13	0.00	-12.29
2	220.00	30.6 QP	46.00	-15.40	1.09V	248	19.00	10.12	1.51	0.00	-11.63
3	264.00	32.6 QP	46.00	-13.40	1.12V	199	18.00	12.89	1.70	0.00	-14.58
4	308.00	33.5 QP	46.00	-12.50	1.17V	153	18.20	13.38	1.91	0.00	-15.29
5	352.00	31.4 QP	46.00	-14.60	1.13V	113	15.00	14.31	2.05	0.00	-16.36
6	396.00	33.2 QP	46.00	-12.80	1.13V	72	15.00	15.96	2.22	0.00	-18.19
7	400.00	33.5 QP	46.00	-12.50	1.09V	216	15.20	16.11	2.24	0.00	-18.35
8	440.00	32.7 QP	46.00	-13.30	1.24V	135	14.00	16.32	2.38	0.00	-18.69
9	484.00	32.4 QP	46.00	-13.60	1.16V	185	13.00	16.96	2.47	0.00	-19.43
10	528.00	35.2 QP	46.00	-10.80	1.13V	226	15.00	17.62	2.60	0.00	-20.22

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

EUT	Notebook PC (with 2.4GHz Wireless USB interface card)	MODEL	Solo 1450
MODE	Channel 1	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70 % RH, 1050 hPa	TESTED BY: Bruce Shiau	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2038.00	50.7 PK	74.00	-23.30	1.19H	16	55.20	27.54	3.46	35.50	4.50
2	*2412.00	96.2 PK	-	-	1.26H	3	64.10	28.31	3.80	0.00	-32.11
3	*2412.00	88.5 AV	-	-	1.26H	16	56.40	28.31	3.80	0.00	-32.12
4	4076.00	54.2 PK	74.00	-19.80	1.07H	2	51.40	32.40	5.24	34.81	-2.83
5	4076.00	50.9 AV	54.00	-3.10	1.07H	16	48.10	32.40	5.24	34.81	-2.83

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2038.00	51.8 PK	74.00	-22.20	1.36V	15	56.30	27.54	3.46	35.50	4.50
2	2038.00	49.2 AV	54.00	-4.80	1.36V	4	53.70	27.54	3.46	35.50	4.50
3	*2412.00	95.1 PK	-	-	1.33V	15	63.02	28.31	3.80	0.00	-32.11
4	*2412.00	87.6 AV	-	-	1.33V	2	55.50	28.31	3.80	0.00	-32.12
5	4076.00	54.7 PK	74.00	-19.30	1.11V	50	51.90	32.40	5.24	34.81	-2.83
6	4076.00	51.4 AV	54.00	-2.60	1.11V	3	48.60	32.40	5.24	34.81	-2.83
7	6113.00	51.9 PK	74.00	-22.10	1.00V	11	45.70	34.24	6.57	34.62	-6.19

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	Notebook PC (with 2.4GHz Wireless USB interface card)	MODEL	Solo 1450
MODE	Channel 6	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70 % RH, 1050 hPa	TESTED BY: Bruce Shiau	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2063.00	49.4 PK	74.00	-24.60	1.58H	12	53.80	27.62	3.50	35.49	4.37
2	2063.00	46.8 AV	74.00	-7.20	1.58H	2	51.20	27.62	3.50	35.49	4.36
3	*2437.00	100.1 PK	-	-	1.17H	3	67.90	28.39	3.85	0.00	-32.25
4	*2437.00	92.3 AV	-	-	1.17H	11	60.10	28.39	3.85	0.00	-32.24
5	4126.00	52.4 PK	74.00	-21.60	1.00H	3	49.60	32.40	5.25	34.83	-2.82
6	6188.00	53.5 PK	74.00	-20.50	1.30H	17	47.20	34.27	6.64	34.64	-6.28
7	6188.00	47.0 AV	74.00	-7.00	1.30H	3	40.70	34.27	6.64	34.64	-6.28

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2068.00	50.2 PK	74.00	-23.80	1.36V	5	54.60	27.62	3.50	35.49	4.36
2	*2437.00	98.1 PK	-	-	1.58V	17	65.90	28.39	3.85	0.00	-32.24
3	*2437.00	90.2 AV	-	-	1.58V	18	58.00	28.39	3.85	0.00	-32.24
4	4126.00	52.8 PK	74.00	-21.20	1.03V	18	50.00	32.40	5.25	34.83	-2.82
5	6188.00	53.0 PK	74.00	-21.00	1.08V	3	46.70	34.27	6.64	34.64	-6.28
6	6188.00	45.2 AV	54.00	-8.80	1.08V	18	38.90	34.27	6.64	34.64	-6.29

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	Notebook PC (with 2.4GHz Wireless USB interface card)	MODEL	Solo 1450
MODE	Channel 11	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70 % RH, 1050 hPa	TESTED BY: Bruce Shiau	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2088.00	51.3 PK	74.00	-22.70	1.05H	227	55.60	25.62	5.02	34.90	4.26
2	2088.00	48.9 AV	54.00	-5.10	1.05H	194	53.20	25.62	5.02	34.90	4.26
3	*2462.00	98.2 PK	-	-	1.10H	108	65.80	27.33	5.08	0.00	-32.40
4	*2462.00	90.8 AV	-	-	1.10H	62	58.40	27.33	5.08	0.00	-32.40
5	4175.00	49.4 PK	74.00	-24.60	1.05H	159	46.90	30.41	6.68	34.58	-2.51
6	4175.00	46.3 AV	74.00	-7.70	1.05H	78	43.80	30.41	6.68	34.58	-2.51
7	6263.00	50.8 PK	74.00	-23.20	1.14H	243	43.80	33.48	8.13	34.60	-7.01
8	6263.00	46.8 AV	74.00	-7.20	1.14H	193	39.80	33.48	8.13	34.60	-7.01

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2088.00	49.4 PK	74.00	-24.60	1.52V	207	53.70	25.62	5.02	34.90	4.26
2	*2462.00	96.8 PK	-	-	1.26V	165	64.40	27.33	5.08	0.00	-32.40
3	*2462.00	89.1 AV	-	-	1.19V	78	56.70	27.33	5.08	0.00	-32.40
4	4176.00	54.2 PK	74.00	-19.80	1.19V	142	51.70	30.41	6.68	34.58	-2.51
5	4176.00	50.6 AV	74.00	-3.40	1.19V	45	48.08	30.41	6.68	34.58	-2.51
6	6263.00	54.1 PK	74.00	-19.90	1.26V	154	47.10	33.48	8.13	34.60	-7.01
7	6263.00	48.8 AV	74.00	-5.20	1.26V	165	41.80	33.48	8.13	34.60	-7.01

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. “ * ” : Fundamental frequency
5. The other emission levels were very low against the limit.

4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839379/002	Jan. 27, 2003
HP PLOTTER	7475A	2641V27755	N/A

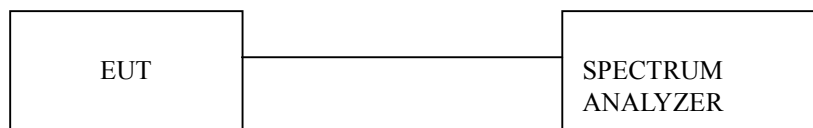
NOTE:

- 1.The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
- 2.The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 100 kHz VBW. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.

4.3.4 TEST SETUP



For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

4.3.5 EUT OPERATING CONDITIONS

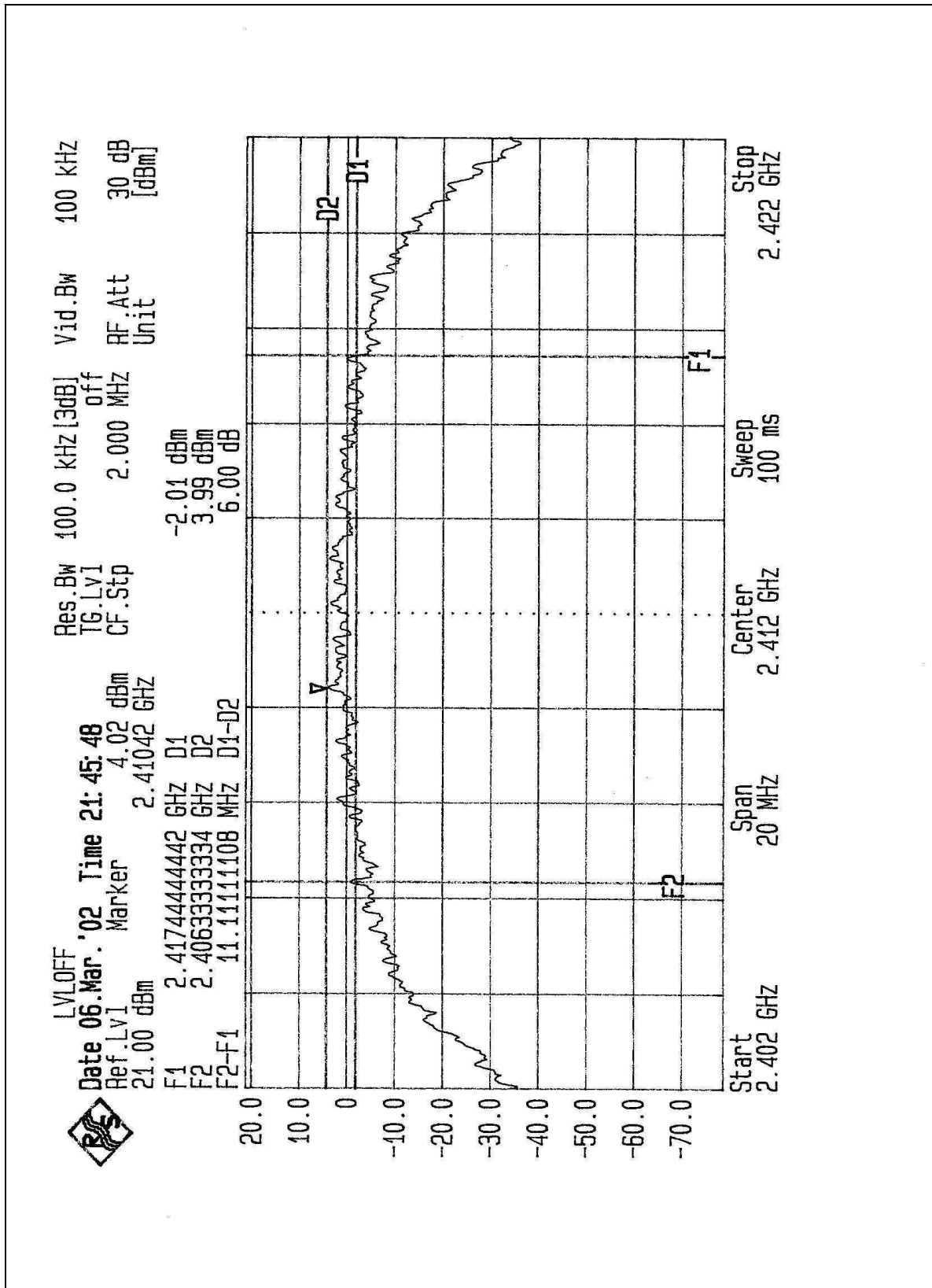
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.6 TEST RESULTS

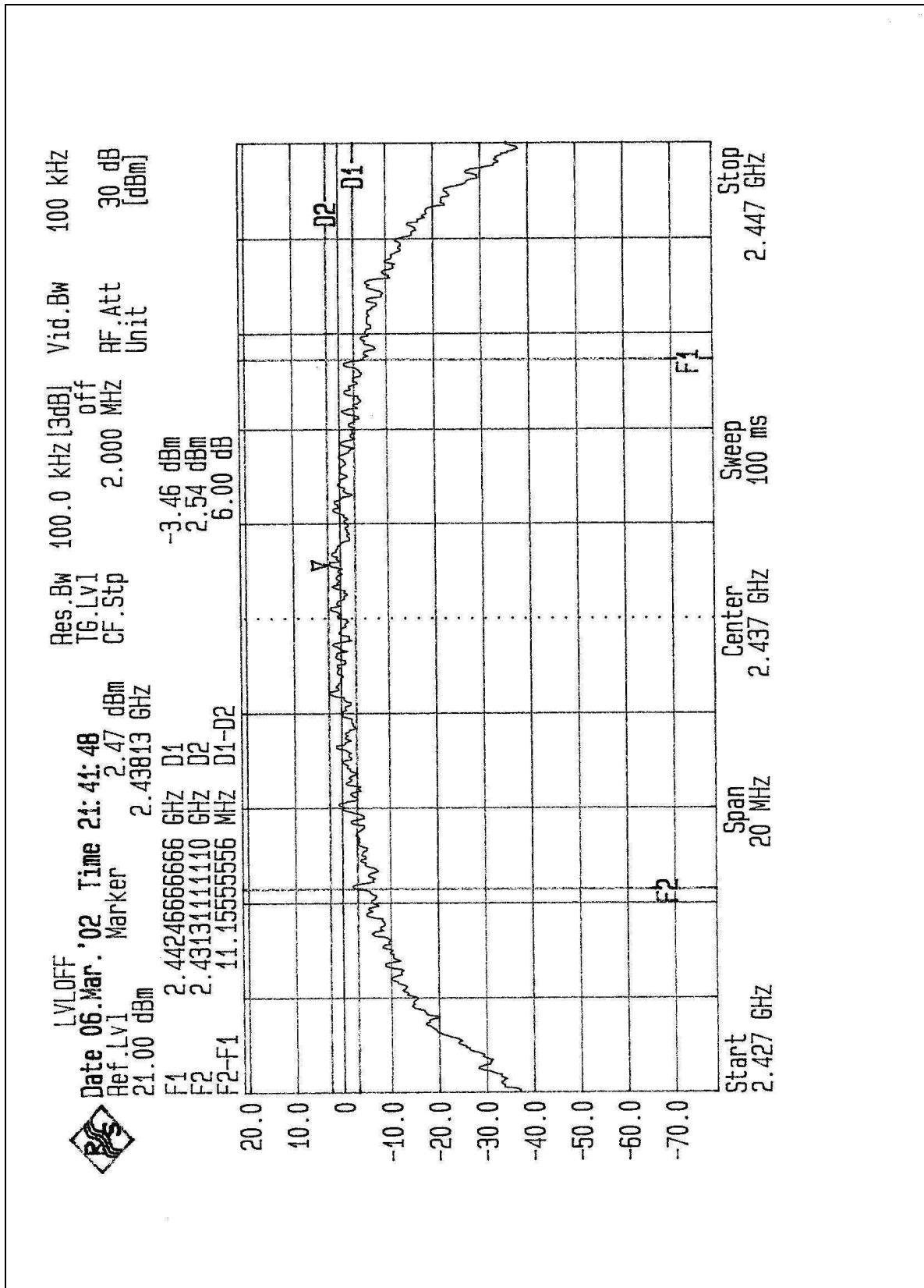
EUT	Notebook PC (with 2.4GHz Wireless USB interface card)	MODEL	Solo 1450
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	15 deg. C, 55%RH, 1005 hPa
TESTED BY: Bunny Yao			

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	11.11	0.5	PASS
6	2437	11.16	0.5	PASS
11	2462	11.18	0.5	PASS

CH1



CH6



CH11

